

ABSTRACT OF THE DISCLOSURE

The present invention provides new polymer induction bonding technology. Induction heating technologies are utilized to weld, forge, bond or set polymer materials. The invention provides controlled-temperature induction heating of polymeric materials by mixing ferromagnetic particles in the polymer to be heated. Temperature control is obtained by selecting ferromagnetic particles with a specific Curie temperature. The ferromagnetic particles will heat up in an induction field, through hysteresis losses, until they reach their Curie temperature. At that point, heat generation through hysteresis loss ceases. This invention is applicable to bonding thermoplastic materials, wherein only the area to be heated has ferromagnetic particles in it; bonding of thermoset composites, which have been processed with a layer of thermoplastic material on one side; curing of thermoset adhesives or composite resins; or consolidating thermoplastic composites.